

QML – The Next Big Thing

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BosonQ Psi

Enabling Simulations with Quantum Paradigm

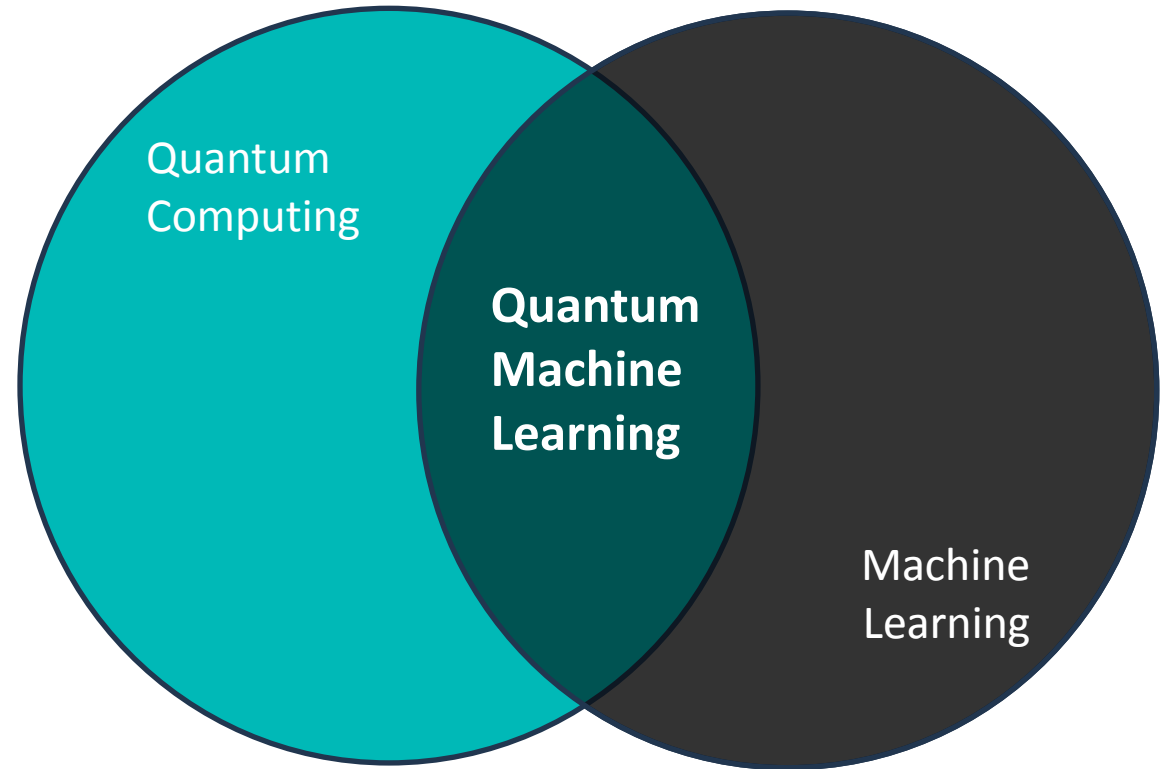


Background: Industry

Scenario

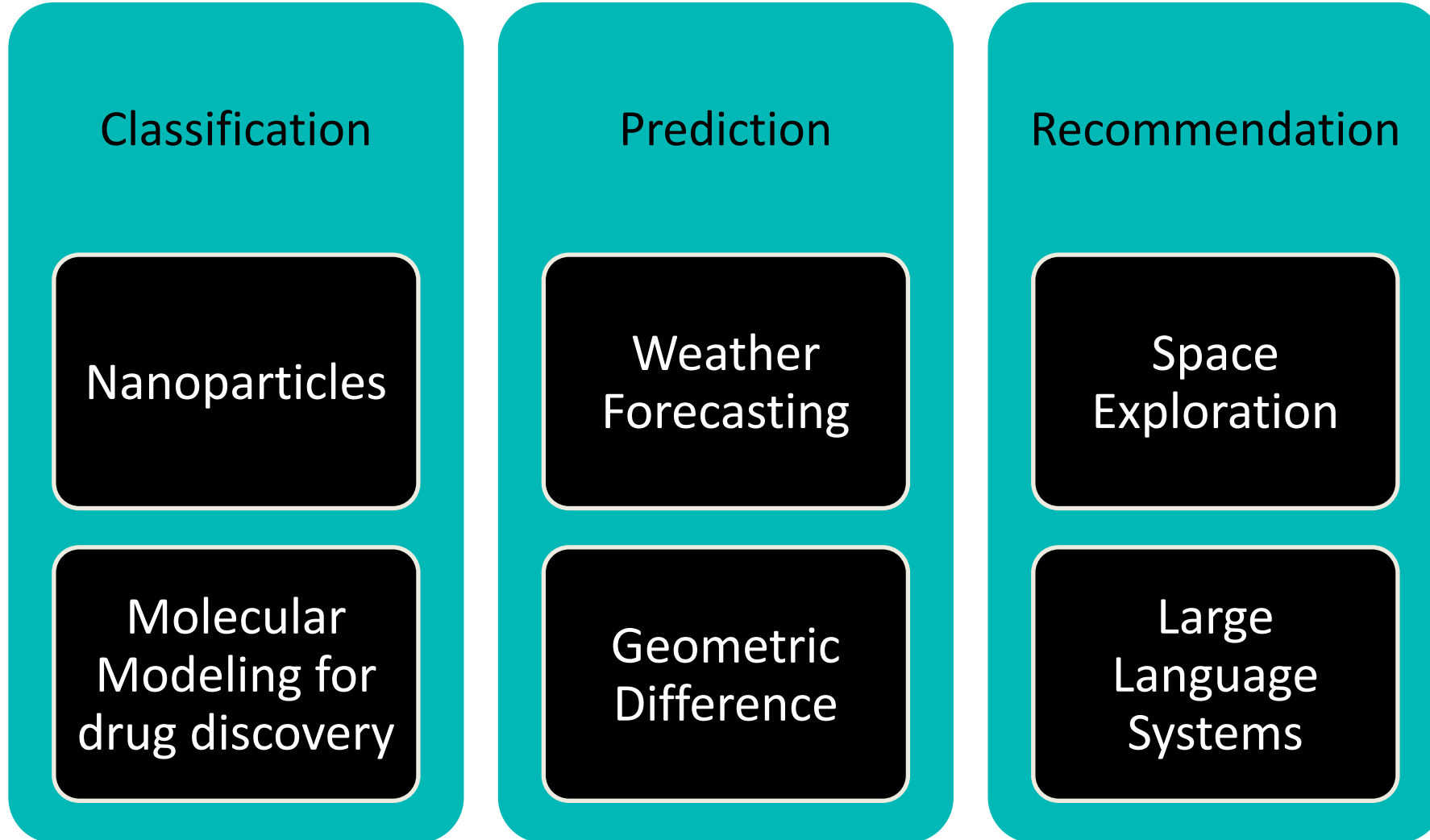
Quantum Machine Learning – The Next Big Thing

- Quantum machine learning is a research area that explores the interplay of ideas from quantum computing and machine learning.
- Machine learning revolves around algorithms, model complexity, and computational Complexity.
- Quantum Computing offers parallel processing capability which is essential to build efficient Machine Learning Solutions
- Quantum phenomena such as Superposition and Entanglement are helping the industry to build efficient Machine Learning algorithms



Applications of QML

QML is becoming a base building block for many scientific solutions



QML Techniques

Quantum Algorithms solving machine learning tasks use various techniques

Quantum Binary Classifier

Grover Search Algorithm Prediction

Quantum-enhanced Reinforcement Learning

Quantum Sampling Techniques

Quantum Neural Networks

Quantum Convolution Neural Network

Dissipative Quantum Neural Network

Hidden Quantum Markov Models

Explainable Quantum Machine Learning

Quantum Transfer Learning

Quantum GAN

Fuzzy Cognitive Maps

QML Ecosystem

Platforms and Approaches available for QML

IBM

- QISKit
- <https://qiskit.org/learn/course/machine-learning-course/>

Xanadu

- PennyLane
- <https://pennylane.ai/qml/>

CIRQ

- TensorFlowQuantum
- <https://www.tensorflow.org/quantum>

D-Wave

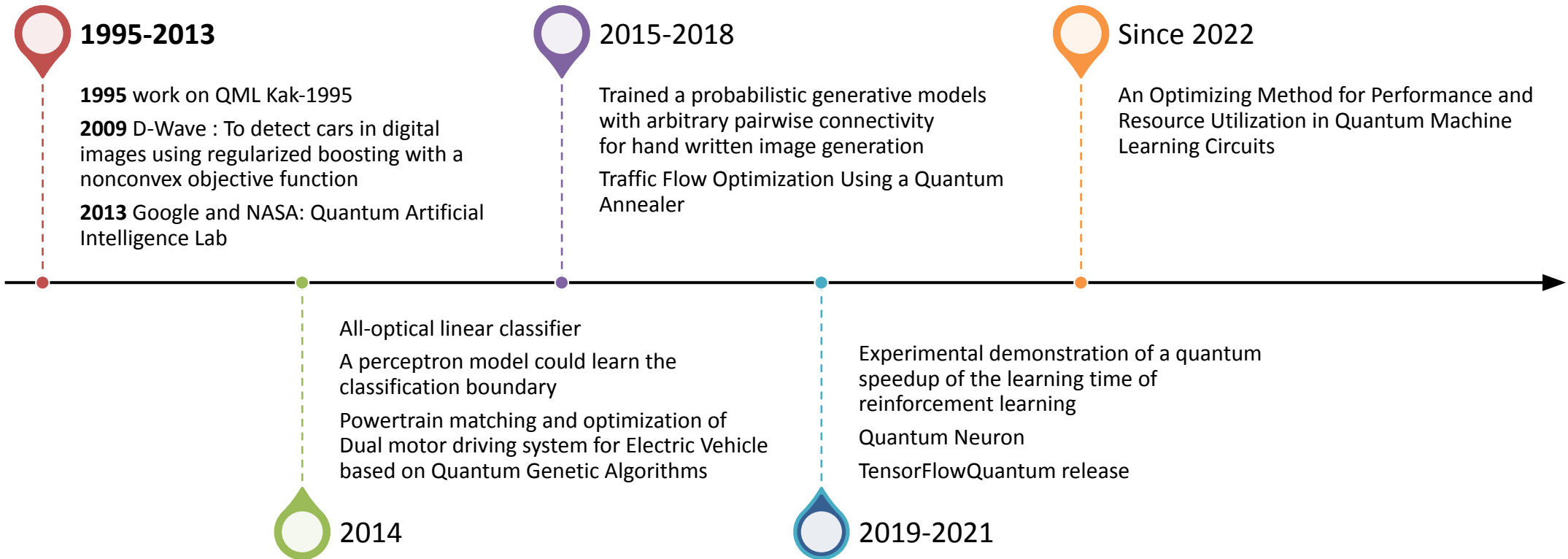
- https://docs.dwavesys.com/docs/latest/handbook_problems.html#machine-learning

PyQuil

- <https://pyquil-docs.rigetti.com/en/stable/>

QML Use Cases

Early attempts and Proof Of Concept for Quantum Machine Learning





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Contact Us

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